New software trained on photographic database may allow facial recognition beneath the mask

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During the COVID-19 pandemic, facemasks became almost ubiquitous and still are in some environments. There is a need for face recognition to be able to "see behind the mask" for security and safety.

Research published in the *International Journal of Computational Vision and Robotics* discusses the potential of new software that might be trained on a large database of photographs of individuals in different poses and holding different facial expressions, where a simulated mask has been superimposed on the image, to allow facial recognition to work despite the mask you use.

Freha Mezzoudj and Chahreddine Medjahed of the Department of Computer Science at the University Hassiba Benbouali of Chlef in Algeria, have developed a comprehensive database of masked faces, termed FEI-SM.

The training set contained images of 2,000 unmasked faces and 18,000 "masked" faces with different types of face covering, surgical masks and consumer-type masks. The database might now be used to test biometric identification of masked individuals.

Facial recognition as a form of biometric identification is now widely used in security systems. It can be used to open one's smartphone, for instance, or be used to allow access to a building only for accredited individuals. It can also be used by the police and other authorities to identify individuals in a given, putatively illegal, setting.

The team explains that "deep learning" a subset of artificial intelligence technology is a powerful approach to image recognition that usually stumbles when faced with a masked individual.

The team has used several convolutional neural network systems—deep learning tools—based on three ResNet and two DarkNet models (ResNet18, ResNet50, ResNet101, DarkNet19, and DarkNet53) to see how successful they might be in the biometric identification of masked and unmasked faces from their database.

They found that ResNet18 is the most accurate and fastest in their tests.

More information: Freha Mezzoudj et al, Efficient masked face identification biometric systems based on ResNet and DarkNet convolutional neural networks, *International Journal of Computational Vision and Robotics* (2024). DOI: 10.1504/IJCVR.2024.138306

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